



Australian Government

MEM27017 Maintain, fault find and rectify hydraulic systems for mobile plant

Release: 1

MEM27017 Maintain, fault find and rectify hydraulic systems for mobile plant

Modification History

Release 1. Supersedes and is equivalent to MEM18052B Maintain fluid power systems for mobile plant

Application

This unit of competency defines the skills and knowledge required to test, fault find and rectify hydraulic systems used in the earthmoving, agricultural and transport industries.

It covers identifying the hydraulic system and components used on mobile plant, general servicing and identifying faults that are related to electronic and fieldbus controls and communication.

Where the rectification of electronic controls is required unit MEM27016 Diagnose and maintain electronic controlling systems on mobile and stationary plant should also be selected.

Where the rectification of communication systems is required unit MEM27018 test, diagnose and rectify mobile and stationary plant external monitoring and control systems should also be selected.

Where the rectification of fieldbus controls is required unit MEM27023 Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations

MEM18055

Dismantle, replace and assemble engineering components

Competency Field

Fixed and Mobile Plant

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, drawings, job sheets or work instructions
2	Secure system from potentially hazardous situations	2.1	Identify sources of stored energy and assess mobile plant for potentially hazardous situations and conditions
		2.2	Bleed down accumulators and position actuators to remove stored energy in accordance with manufacturer instructions
3	Identify equipment hydraulic systems and relevant operational data	3.1	Check specifications and drawings for mobile equipment systems, actuators and accessories dependent on hydraulic power
		3.2	Identify control modules and fieldbus wiring locations for hydraulic systems
		3.3	Consult equipment operator where appropriate and collect additional data on equipment performance and faults
		3.4	Check previous maintenance reports and preventative maintenance schedules and review for additional

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fault-finding data

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|---|--|-----|--|
| 4 | Check hydraulic system components and fluid | 4.1 | Identify system components using appropriate circuit diagrams or manufacturer instructions |
| | | 4.2 | Inspect equipment for obvious faults, leaks and contamination |
| | | 4.3 | Access, inspect and test the operational function of components in accordance with SOPs |
| | | 4.4 | Trace and localise faults with reference to manufacturer troubleshooting procedures, including using accessing and interpreting fault codes in controllers |
| | | 4.5 | Determine parts that require repair or replacement |
| | | 4.6 | Check hydraulic fluid and components for signs of contamination |
| | | | |
| 5 | Rectify component faults | 5.1 | Remove faulty components from system using appropriate tools, procedures and techniques |
| | | 5.2 | Source replacement components from manufacturer/supplier |
| | | 5.3 | Prepare and assemble hoses, tubes and pipework |
| | | 5.4 | Assemble and refit replacement components and conductors to system |
| | | 5.5 | Replace filter or fluid where required |
| | | 5.6 | Test and adjust system for correct operation according to SOPs |
| | | | |
| 6 | Dismantle, inspect and rectify linear | 6.1 | Dismantle hydraulic cylinders and rams using appropriate tools, procedures and techniques |
| | | 6.2 | Evaluate component parts for condition |

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Performance criteria describe the performance needed to demonstrate achievement of the element.

	actuators	6.3	Fit seals and bearings in accordance with manufacturer specifications
		6.4	Reassemble and fit cylinders/rams in accordance with manufacturer instructions
		6.5	Test assembly in accordance with manufacturer instructions
7	Complete maintenance and fault rectification work	7.1	Perform scheduled preventive maintenance and other hydraulic systems servicing according to manufacturer schedules and instructions
		7.2	Verify correct operation of the system using fluid power principles and manufacturer instructions
		7.3	Instigate appropriate follow-up procedures
		7.4	Update maintenance and service records

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

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General servicing includes the following:

- fluid replacement
- filtration requirements
- oil sampling
- checking for and rectifying faults
- preventative maintenance
- checks and adjustments to suit changes in operating conditions

Hydraulic systems include the following:

- open circuit
- closed circuit
- systems used for one (1) or more of the following:
 - direct motive power
 - powering actuators
 - braking
 - transmissions and gearboxes
 - pumping

Contaminants include one (1) or more of the following:

- dirt
- metal particles
- other particulates
- water
- fuel
- non-hydraulic oil

Rectifying includes the following:

- replacement of components and fittings
- filtering or replacement of hydraulic fluid
- assembly and fitting of hydraulic hoses
- flushing/cleaning of tubing and pipework
- resealing and repairs to cylinders and rams
- resetting of controls

Checks include one (1) or more of the following:

- pressure and flow testing
- cycle times
- basic interrogation of diagnostic system controllers
- basic electronic servicing

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Components include one (1) or more of the following:

- actuators
- fixed and variable displacement pumps
- pressure, directional and flow control valves
- electro-hydraulic servo and servo-proportional valve (EHSV)
- hydraulic motors
- reservoirs
- contamination control components (filtration)
- fluid conductors/fittings
- other associated equipment

Service of hydraulic systems include the following:

- change out of hydraulic components, including:
 - pumps
 - valves
 - actuators
- the associated remedial actions required, including:
 - system flushing and purging
 - setting of component parameters

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM18052B Maintain fluid power systems for mobile plant

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM27017 Maintain, fault find and rectify hydraulic systems for mobile plant

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, charts, lists, drawings and other applicable reference documents to maintain hydraulic systems on mobile plant
- identifying sources of stored energy and hazardous situations/conditions, including bleeding down accumulators and position actuators, and applying appropriate safety measures
- fault finding hydraulic system down to component level using appropriate fluid power principles and procedures
- inspecting and testing components using appropriate equipment in accordance with procedures
- identifying and tracing fieldbus circuits and control modules related to hydraulic systems on equipment
- removing/refitting faulty components to system, including pipes, hoses, conductors and fittings and where appropriate cutting and assembling conductors to length using appropriate tooling/machine, techniques and procedures
- undertaking calculation and numerical operations associated with maintaining fluid power systems on mobile plant
- testing and adjusting replacement components for correct operation and compliance to specifications
- dismantling linear actuators without damage using appropriate tools, techniques/procedures and safety measures and using specifications to identify performance/condition of cylinders and rams for wear and damage
- fitting seals and bearings and reassembling cylinder/ram in accordance with manufacturer instructions
- refitting and testing assembly to machine and verifying repairs on machine circuit and/or test rig to specifications
- carrying out general servicing of hydraulic system in accordance with manufacturer instructions
- recording/reporting service activities in accordance with SOPs.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- different sources of stored energy and their applications and reasons for bleeding accumulators and actuators and the hazards associated with working on pressurised systems
- open circuit hydraulic systems, including:
 - applications
 - fixed displacement pump systems, including simple Open centre DCV systems and closed centre with bypass (3 port) compensator inlet
 - variable displacement pump systems, including pre and post-compensated systems
 - open centre systems
 - pump control systems, including proportional displacement control for open circuit pumps
 - common faults and preventative maintenance
- closed circuit systems, including:
 - applications
 - simple fixed/variable pumps with manual control
 - common faults and preventative maintenance
- full range of hydraulic system components in a mobile plant application
- information on circuit diagram or manufacturer instructions
- characteristics and operational function of each system component
- impact of other equipment systems on the hydraulic system
- methods and techniques for tracing and localising faults and problems and reasons relating to faulty hydraulic system components/ operation in accordance with specifications
- procedures for:
 - inspecting and testing hydraulic system components and equipment to be used
 - checking and adjusting the system
 - dismantling linear actuators and tools, techniques, procedures and safety measures to be used
 - fitting bearings and seals
 - reassembly/fitting of cylinder/ram and sequence to be used
 - testing and verifying repairs using machine circuits and/or test rigs and necessary remedial action
- common faults in hydraulic components
- specifications and correct operation of each hydraulic system component and conductors
- removal methods for various components
- information in catalogues or electronic media and procedures to obtain replacement parts
- typical conductor types and fittings their applications
- methods for cutting/assembling hoses/tubes/pipework

- tools and techniques for fitting replacement components and conductors
- methods of inspection and measurement and guides and specifications for reusable parts
- manufacturer scheduled service timeframes, service items and service procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining, fault finding and rectifying hydraulic systems for mobile plant at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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